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SEVENTH BI-MONTHLY PROGRESS REPORT
UNIVERSITY OF ALASKA
ERTS PROJECT NO. 110-2
OCTOBER 1, 1973

A. TITLE OF INVESTIGATION: Identification of Phenological Stages and Vegetative Types for Land Use Classification

B. PRINCIPAL INVESTIGATOR/GSFC ID: Jay D. McKendrick/UN 641

C. PROBLEMS IMPEDING INVESTIGATION:

Two equipment items needed for handling digital data, the color display unit (CDU) and Bausch and Lomb zoom transfer scope (ZTS), were still on order during this reporting period. In order to conserve salary expenditures for use after the CDU and ZTS become available, we reduced our ERTS work to periodically filing incoming scenes during August and early September.

The ZTS was delivered during September while we were out of town working on other projects. After assembling the instrument we discovered its magnification capabilities were only 13X instead of the specified 14X. In order to overlay the 70 mm ERTS chip on a 1:250K map we need 13.476X magnification. Fortunately 9 x 9 transparencies were available for certain scenes and we are able to overlay those at 1:250K.

The CDU was delivered to the Geophysical Institute in Fairbanks during September. On September 28, 1973 we traveled to Fairbanks to become acquainted with its operation. The CDU operates satisfactorily only on one of its three channels, which limits its present usefulness. That restriction is expected to be corrected soon.

D. PROGRESS REPORT:

1. Accomplishments during reporting period.

N73-32242

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CSCL 08F

(E73-11066) IDENTIFICATION OF
PHENOLOGICAL STAGES AND VEGETATIVE TYPES
FOR LAND USE CLASSIFICATION Bimonthly
Progress Report (Alaska Univ., Palmer.)
6 p HC \$3.00

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Vegetative Types for Land Use Classification

DISCIPLINE: Agriculture/Forestry/Range Resources

SUBDISCIPLINE: Range Survey and Classification

SUMMARY OF SIGNIFICANT RESULTS:

Digital signatures derived from the CDU are comparable to those taken from the printouts. Therefore, using the CDU to derive signatures should be more efficient, since there is considerable time required in turn around with the computer and time required locating vegetation stands on the printout.

Before retiring from the University of Alaska, Mr. Ivan Branton, former PI, surveyed five Alaskan user groups for their estimates of the cost-benefit value of ERTS data compared to conventional data. Mr. Branton's report generally indicated users could not place dollars and cents values on ERTS data compared to conventional aircraft data. This finding is not surprising because the synoptic view of ERTS is incomparable to conventional aircraft data in many respects. Also most user groups are yet unaware of the potentials and limitations of ERTS data.

ERTS scenes including all or portions of our test area received to date have been evaluated for usefulness in plant phenological observations. Digital tapes were ordered for those scenes that will be most useful in following seasonal signature changes. There is an area on the west side of Cook Inlet which appears cloud-free in scenes for each growing season month except July. That is the only area with such coverage which we could use for observing phenological changes in this study.

With the aid of the ZTS we discovered a scale discrepancy between an ERTS image and portions of the USGS Anchorage quadrangle map. That error amounted to a 0.3 mile distance error in 22 miles in a mountainous region. We believe the source of the error is within the USGS map and probably resulted from scale problems with the original aircraft data used to complete the USGS map. The error is great enough to cause problems with thematic overlays for the quad sheet, i.e. certain valley vegetation types mapped according to ERTS data appear to be on mountain ridges on the USGS quadrangle map.

2. Plans for the next reporting period.

The ZTS and CDU will be used to derive signatures both for mapping and evaluating signature changes due to phenological events. Progress will depend upon arrival of digital tapes and the CDU being available for our

use. Products to be compared are: existing vegetation maps, digital display of ERTS, maps drawn from 9 x 9 ERTS transparencies using the ZTS, and aircraft data for the study transects.

E. SIGNIFICANT RESULTS:

Our first attempts to use the CDU, although brief, proved that signature extractions from that instrument are possible and also comparable to those derived from printouts (Table 1). In order to use the CDU and digital data, however, one must either be familiar with the location being displayed or else have ground truth, i.e. aircraft data readily available during the operation.

F. PUBLICATIONS: None

G. RECOMMENDATIONS: None

H. CHANGES IN STANDING ORDER FORMS: None

I. ERTS IMAGE DESCRIPTORS FORMS:

Completed form for new data is attached.

J. DATA REQUEST FORMS: None.

TABLE 1. Comparison of CDU derived signatures and printout derived signatures for scene 1049-20505.

| <u>FEATURES</u> | BAND 5 | | BAND 7 | |
|-----------------|------------|-----------------|------------|-----------------|
| | <u>CDU</u> | <u>PRINTOUT</u> | <u>CDU</u> | <u>PRINTOUT</u> |
| Clear lakes | 10-11 | 9-10 | 1-3 | 1-3 |
| Silty water | 19-21 | 20-21 | 4-7 | 4-6 |
| Wet lands | --- | --- | 8-15 | 14-15 |
| Birch/aspen | 11-15 | 11-12 | 15-19 | 14-18 |
| Clouds | 64+ | 26-127 | --- | --- |
| Grass | 16-23 | 14-18 | --- | 18-24 |

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ERTS IMAGE DESCRIPTOR FORM
(See Instructions on Back)

DATE August 6, 1973

PRINCIPAL INVESTIGATOR Dr. J. D. McKendrick

GSFC UN-641

ORGANIZATION University of Alaska 110-02

NDPF USE ONLY

D _____

N _____

ID _____

| PRODUCT ID (INCLUDE BAND AND PRODUCT) | FREQUENTLY USED DESCRIPTORS* | | | | DESCRIPTORS |
|--|------------------------------|---------|------|------|-------------|
| | River | Glacier | Lake | Mts. | |
| 1296-20231 | ✓ | ✓ | | ✓ | Basin |
| 1301-20503 | ✓ | | | ✓ | River |
| 1301-20501 | ✓ | | | ✓ | River |
| 1315-20284 | ✓ | ✓ | | ✓ | Basin |
| 1316-20333 | ✓ | | ✓ | | Highway |
| 1316-20340 | ✓ | ✓ | ✓ | ✓ | |
| 1318-20441 | ✓ | | ✓ | | River |
| 1319-20520 | ✓ | ✓ | ✓ | ✓ | Peninsula |
| 1319-20513 | ✓ | ✓ | ✓ | ✓ | Valley |
| 1320-20560 | ✓ | | ✓ | ✓ | River |
| 1336-20440 | ✓ | | ✓ | ✓ | River |
| 1390-20450 | ✓ | ✓ | ✓ | ✓ | Highway |
| 1390-20452 | ✓ | ✓ | ✓ | ✓ | Highway |
| | | | | | |
| | | | | | |

*FOR DESCRIPTORS WHICH WILL OCCUR FREQUENTLY, WRITE THE DESCRIPTOR TERMS IN THESE COLUMN HEADING SPACES NOW AND USE A CHECK (✓) MARK IN THE APPROPRIATE PRODUCT ID LINES. (FOR OTHER DESCRIPTORS, WRITE THE TERM UNDER THE DESCRIPTORS COLUMN).

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